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(54) **Storage device, storage/reproducing device, and reproducing device**

Speichervorrichtung, Speicher-/Wiedergabevorrichtung und Wiedergabevorrichtung

Dispositif de stockage, dispositif de stockage/reproduction, et dispositifs de reproduction

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- **"DISK SUPPORT DEVICE FOR DISKLESS PERSONAL COMPUTERS" IBM TECHNICAL DISCLOSURE BULLETIN,US,IBM CORP. NEW YORK, vol. 37, no. 7, 1 July 1994 (1994-07-01), pages 553-555, XP000455614 ISSN: 0018-8689**

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Description

[0001] The present invention relates to a storage device, a storage/reproducing device, and a rewritable reproducing device that are incorporated in or attached to a personal computer as a unitary structure. More particularly, the invention relates to a storage device, a storage/reproducing device, and a reproducing device that are incorporated in or attached to a desk-top personal computer as a unitary structure.

[0002] Storage devices of this kind have heretofore not been equipped with an external data input means, and data have been always input through a personal computer such as a desk-top one. Without a personal computer, therefore, the storage device is unable to operate. However, with the widespread use of various information equipment such as PHS (Personal Handyphone System), digital camera and the like, which have a prerequisite of transferring the data to a personal computer, it would be more convenient if transfer of data can be relayed by a storage device.

[0003] Therefore, there arises a technical problem to be solved that storage devices of this kind must be provided with a function of directly fetching the data from an external unit and relaying the transfer of data. The object of the present invention is to solve this problem.

[0004] So far, furthermore, conventional storage/reproducing devices and the reproducing devices of this type have usually been formed in the shape of a thin box. Therefore, a storage/reproducing device of built-in type has a narrow area exposed from the front of the desk-top personal computer, and is difficult to secure a space where the connector for fetching record data from a external data unit is installed. It may be possible to lead out the connector cable from the back of the personal computer and lay the cable along the outer side of the personal computer. However, this causes the operation to be complex, marring the appearance. It would be convenient if the storage/reproducing device and the read-only reproducing device of the attached type, too, have a function of easily fetching data from an external data unit.

[0005] Therefore, there arises a technical problem to be solved that storage/reproducing devices and the reproducing devices of this kind should be improved to easily fetch external data. The object of the present invention is to solve this problem.

[0006] US 5583745 describes a data recording and reproducing device that comprises a first memory unit, selected from a floppy disk drive or a hard disk drive unit. The device further comprises a second memory unit and the device is connected to a computer.

[0007] DE-U1-9203952 describes a manual switch apparatus for selecting one of at least two disk drives for connection to a computer.

[0008] The present invention has been proposed in order to achieve the above-mentioned objects. According to the present invention, there is provided a storage device in accordance with the appended independent claim 1.

[0009] A preferred embodiment of the present invention comprises a storage/reproducing device accommodated in a storing portion formed in a recessed manner in the front of a personal computer, or a storage/reproducing device externally attached to a personal computer, wherein the space wave communication port is disposed in the front or on the top, the data fetched by the space wave communication port are recorded on a storage means of optical, magnetic, or magneto-optical type, and the recorded data are read out and output to the personal computer.

[0010] Another preferred embodiment of the present invention comprises a storage/reproducing device accommodated in a storing portion formed in a recessed manner in the front of a personal computer, or a storage/reproducing device externally attached to a personal computer, wherein the space wave communication port is disposed in the front or on the top, so that the data fetched by the space wave communication port, too, are output to the personal computer, in addition to a reproducing device that reads data stored in a storage means of optical, magnetic or magneto-optical type and outputs the data to the personal computer.

[0011] Certain embodiments of the invention will now be described by way of example only and with reference to the drawings.

Fig 1 is a front view of a desk-top personal computer of a first embodiment according to the invention;
Fig. 2 is a block diagram of Fig. 1;
Fig. 3 is a front view illustrating a second embodiment of the invention;
Fig. 4 is a front view illustrating a third embodiment of the invention;
Fig. 5 is a block diagram of Figs. 3 and 4;
Fig. 6 is a front view illustrating a fourth embodiment of the invention;
Fig. 7 is a front view illustrating a fifth embodiment of the invention; and
Fig. 8 is a block diagram of Figs. 6 and 7.

[0012] A first embodiment of the invention will now be described below in detail with reference to Figs. 1 to 2. In Fig. 1, reference numeral 11 denotes a desk-top personal computer. A body 12 of the desk-top personal computer 11 incorporates a CD-R drive unit 13 which is an example of a storage unit according to the present invention. The CD-R drive unit 13 is formed in the shape of a thin box, and its front face is exposed from the front of the main body 12. In the exposed front face are disposed a CD-R slot 14, a PC card slot 15, an infrared communication port 16 of IrDA standard, and a modular jack 17 for connection to a telephone circuit.

[0013] As shown in Fig. 2, the PC card slot 15 is formed integrally with a card reader unit 18. Upon inserting a PC card 20 such as PHS 19 or the like in the PC

card slot 15, the card reader unit 18 reads the data recorded on the PC card 20. Owing to a detent mechanism or the like mechanism, the PC card 20 can be detachably inserted in the PC card slot 15.

[0014] Furthermore, the infrared communication port 16 receives data transmitted from a digital camera 21 having an infrared communication function of the IrDA standards placed in front of the CD-R drive unit 13. Thus, image data taken by using the digital camera 21 are transferred to the CD-R drive unit 13.

[0015] By connecting a telephone circuit 22 to the modular jack 17, furthermore, various data sources are accessible through the telephone circuit 22 and can be fetched by the CD-R drive unit 13.

[0016] Various data fetched by the CD-R drive unit 13 from the card reader unit 18, infrared communication port 16 and modular jack 17, are subjected to intermediate processing through interface units 23, 24, 25, and arrive at a switch 26. When the switch 26 is flipped to the horizontal direction in the drawing, the data are once buffered by a memory control unit 27. When a switch 28 at the succeeding stage of the memory control unit 27 (left side in the drawing) is flipped to the horizontal direction in the drawing, the data pass through the switch 28 and are subjected to parity checking through a data processing unit 29.

[0017] After the electric power for recording is controlled by a PW (pulse width) control unit 30, the data are written into a CD-R 32 loaded in the CD-R slot 14 by an optical head 31. Thus, the data from the PC card 20, digital camera 21 or telephone circuit 22 are directly fetched by the CD-R drive unit, and are recorded and stored without passing through the desktop personal computer 11.

[0018] When the switch 26 is flipped to a lower tilted direction in the drawing, the data that have passed through the interface units 23, 24, 25 are converted through an interface unit 33 into an interface format of the SCSI standard or the ATAPI standard. When a switch 34 at the succeeding stage of the interface unit 33 (lower side in the drawing) is flipped toward the right tilted direction in the drawing, the data arrive at a computer input/output terminal 35 through the switch 34, and are output to the body 12 of the desk-top personal computer 11 through a cable 36. Thus, the CD-R drive unit 13 in this case serves as an input means enabling the desk-top personal computer 11 to fetch external data. Therefore, even when the desktop personal computer 11 is not provided with means for inputting external data, external data can be easily fetched through the CD-R drive unit 13, enabling the desk-top personal computer 11 to have an improved function.

[0019] When the data in the body 12 of the desk-top personal computer 11 are output to the CD-R drive unit 13 after flipping the switch 28 toward the lower tilted direction in the drawing and flipping the switch 34 toward the left tilted direction in the drawing, then, the data pass through the switch 34 and are subjected to an intermediate processing at the interface unit 37, buffered by a memory control unit 38, and sent to the switch 28. The data then pass through the switch 28, data processing unit 29 and PW control unit 30, and are written onto the CD-R 32 by the optical head 31. Thus, the CD-R drive unit 13 in this case serves as an auxiliary storage unit for the desk-top personal computer 11. Therefore, when the capacity of the hard disk in the desk-top personal computer 11 is insufficient, the CD-R drive unit 13 can be used in its place.

[0020] When the data written on the CD-R 32 are read out by the optical head 31 after flipping the switch 34 toward the left tilted direction in the drawing, the data are demodulated by a demodulator unit 39, and then subjected to a processing such as a processing of removing the parity code in a data processing unit 40. The data are then fetched by the body 12 of the desktop personal computer 11 passing through the memory control unit 38 and the interface unit 37. Thus, the data written on the CD-R 32 are reproduced on the monitor of the desk-top personal computer 11, making it possible to edit the data.

[0021] For the storage device of the invention as described above, external data can be directly fetched through "other input units" without passing through a personal computer. It is further possible to output fetched external data directly to the personal computer, or to fetch data from the personal computer and record them by using three kinds of "switching means". It is therefore possible to add an input function to a personal computer which is not provided with an input unit that corresponds to the above-mentioned "other input units". Besides, the storage device can be used as a so-called auxiliary storage device of the personal computer, contributing to enhancing the utility of the personal computer and of various information equipment.

[0022] The storage device according to the embodiment fetches external data by space wave communication. The space wave communication port which is an input unit needs an installation space smaller than that of a connector, and does not mar the appearance. Therefore, this is very effective when the storage unit is incorporated as a unit in the desk-top personal computer.

[0023] The storage device according to the embodiment accommodates the PC card, receives the data, and records and regenerates the data. Therefore, the user is allowed to directly input the data from, for example, the PHS, or to input data into the PC card by using a PDA (Personal Digital Assistant) or the like while he is out, bringing it back with him and easily transferring the data to the storage device.

[0024] For the storage device according to the invention having a telephone port, various data sources are accessible through a telephone circuit, and data can be recorded and reproduced.

[0025] Further embodiments of the invention will now be described in detail with reference to Figs. 3 to 8. For

simple description, common elements in the embodiments of Figs. 3 to 8 are denoted by the same reference numerals.

[0026] Referring to Fig. 3, reference numeral 11A denotes a desk-top personal computer. A storing portion 41 of the shape of a thin box is formed in a recessed manner in the front of the desk-top personal computer 11A, and a CD-R drive unit 42 which is a storage/reproducing device of the invention is accommodated in the storing portion 41. Therefore, the front of the CD-R drive unit 42 is exposed from the storing portion 41. The CD-R drive slot 43 is provided in the exposed front and an infrared communication port 44 conforming to the IrDA standards is disposed therein. Moreover, a PC card slot 45 and a modular jack 46 for connection to a telephone circuit are arranged.

[0027] A CD-R drive unit 47 which is a storage/reproducing device of the invention is attached to a desk-top personal computer 11B shown in Fig. 4. A CD-R slot 43 is opened in the front of the CD-R drive unit 47, an infrared communication port 44 of the IrDA standards is disposed and, besides, a PC card slot 45 and a modular jack 46 for connection to a telephone circuit are arranged.

[0028] As shown in Fig. 5, the PC card slot 45 is formed integrally with a card reader unit 18A. When a PC card 20A of a PHS 19 is inserted in the PC card slot 45, the card reader unit 18A reads the data through the PC card 20A. Owing to a detent mechanism, the PC card 20A can be detachably inserted in the PC card slot 45. Upon connecting a telephone circuit 48 to the modular jack 46, furthermore, a variety of data sources can be accessed via the telephone circuit 48, and data can be fetched by the CD-R drive units 42, 47.

[0029] The infrared communication port 44 receives data transmitted from a digital camera 49 having an infrared communication function conforming to the IrDA standards placed in front of the CD-R drive unit 42, 47. Thus, the data of the image taken by the digital camera 49 are very easily transferred to the CD-R drive unit 42, 47. Besides, the infrared communication port 44 requires an installation space smaller than that of a connector, and is easy to install and does not mar the appearance.

[0030] The image data fetched by the CD-R drive unit 42, 47 are subjected to an intermediate processing through an interface unit 50, and are sent to a switch 51. After flipping the switch 51 toward the horizontal direction in the drawing, the image data are once buffered by the memory control unit 52. Then, flipping a switch 53 at the succeeding stage of the memory control unit 52 (left side in the drawing), the image data are sent to a data processing unit 54 through the switch 53 and subjected to parity checking. Then, the electric power for recording is controlled by the PW control unit 55, and the data are written by an optical head 56 into a CD-R 57 stored in the CD-R slot 43, and stored.

[0031] To reproduce image data recorded and stored in the CD-R 57, the image data are read out by the optical head 56. The image data that are read out are demodulated by a demodulator unit 58 and are subjected to a processing such as a processing of removing the parity code in a data processing unit 59. After buffering by the memory control unit 60, the data are converted into an interface format of the SCSI standards or the ATAPI standard through an interface unit 61, and sent to a switch 62. When the switch 62 is flipped toward the left tilted direction in the drawing, the image data are output to the desk-top personal computer 11A, 11B through a computer input/output terminal 63 and a cable 64. Thus, the image data are reproduced and displayed on the monitor of the desk-top personal computer 11A, 11B, making it possible to edit and print out the image data.

[0032] When the switch 51 is flipped toward the lower tilted direction in the drawing, the image data that have passed through the interface unit 50 are converted into the interface format of the above-mentioned predetermined standards through an interface unit 65. When the switch 62 is flipped toward the right tilted direction in the drawing, the image data are output to the desk-top personal computer 11A, 11B through the computer input/output terminal 63 and the cable 64. Thus, the CD-R drive unit 42, 47 in this case serves as an input means enabling the desk-top personal computer 11A, 11B to receive the image data, and helps improve the performance of the desk-top personal computer which has not been provided with a space wave communication function such as of infrared rays.

[0033] The data fetched by the CD-R drive unit 42, 47 from the card reader unit 18A and the modular jack 46 are subjected to an intermediate processing through interface units 66, 67, and sent to the switch 51. When the switches 51 and 53 are flipped toward the horizontal direction in the drawing, data are written into the CD-R 57 by the optical head 56 through the memory control unit 52, data processing unit 54 and PW control unit 55, and are recorded and stored like the above-mentioned image data. The same holds for reproduction. When the switch 62 is flipped toward the left tilted direction in the drawing, the data are output to the desk-top personal computer 11A, 11B through the optical head 56, demodulator unit 58, data processing unit 59, memory control unit 60, interface unit 61, computer input/output terminal 63 and cable 64.

[0034] When the switch 51 is flipped toward the lower tilted direction in the drawing and the switch 62 is flipped toward the right tilted direction in the drawing, the data fetched by the CD-R drive unit 42, 47 from the card reader unit 18A and modular jack 46 are output to the desk-top personal computer 11A, 11B through the interface unit 66 or 67, interface unit 65, computer input/output terminal 63 and cable 64 like the above-mentioned image data. In this case, the CD-R drive unit 42, 47 serves as an input means enabling the desktop personal computer 11A, 11B to fetch data recorded in the PC card

20A and data accessed through the telephone circuit 48.

[0035] Next, after the switch 53 is flipped to the lower tilted direction in the drawing, and the switch 62 is flipped toward the left tilted direction in the drawing, data in the desk-top personal computer 11A, 11B are output to the CD-R drive unit 42, 47 from the desk-top personal computer 11A, 11B through the cable 64. Then, the data are written into the CD-R 57 by the optical head 56 through the interface unit 61, memory control unit 60, data processing unit 54 and PW control unit 55. In this case, the CD-R drive unit 42, 47 serves as an auxiliary storage device for the desk-top personal computer 11A, 11B.

[0036] In a desk-top personal computer 68A shown in Fig. 6, a storing portion 41 is formed in a recessed manner in the front thereof, and a CD-ROM drive unit 42A which is a reproducing device according to the invention is accommodated in the storing portion 41. In the front of the CD-ROM drive unit 42A, a CD-ROM slot 43 is formed and an infrared communication port 44 of the IrDA standards is disposed. There are further disposed a PC card slot 45, a modular jack 46 for connection to a telephone circuit, and the like.

[0037] As shown in Fig. 7, a CD-ROM drive unit 42B which is a reproducing device of the invention is attached to a desk-top personal computer 68B. In the front of the CD-ROM drive unit 42B, the CD-ROM slot 43 is formed, the infrared communication port 44 of the IrDA standard is disposed and, besides, the PC card slot 45, modular jack 46 for connection to a telephone circuit, and the like, are disposed.

[0038] As shown in Fig. 8, the CD-ROM drive unit 42A, 42B has a structure from which are removed constituent elements related to the writing function (concretely, switch 51, memory control unit 52, switch 53, data processing unit 54, and PW control unit 55) of the CDR drive unit 42, 47. Normally, the switch 62 is flipped toward the left in the drawing, the data recorded in the CD-ROM 69 in the CD-ROM slot 43 are read out by a read-only optical head 70, and the data that are read out are output to the desk-top personal computer 68A, 68B through the demodulator unit 58, data processing unit 59, memory control unit 60, interface unit 61, computer output terminal 71, and cable 72, and reproduced.

[0039] When the switch 62 is flipped toward the right tilted direction in the drawing, image data of a digital camera 49 are fetched by the infrared communication port 44, and output to the desk-top personal computer 68A, 68B through the interface unit 50, interface unit 65, computer output terminal 71 and cable 72. Thus, the image data can be edited by using the desktop personal computer 68A, 68B and can be printed out. The CD-ROM drive unit 42A, 42B in this case serves as an input means enabling the desk-top personal computer 68A, 68B to fetch image data from the digital camera 49, and helps improve the function of the desk-top personal computer which has not been furnished with an infrared space wave communication function.

[0040] Similarly, the data fetched through the PC card 20A and the data accessed through the telephone circuit 48, can be fetched by the CD-ROM drive unit 42A, 42B through the card reader unit 18A formed integrally with the PC card slot 45 and the modular jack 46, and can be output to the desk-top personal computer 68A, 68B through the interface unit 66 or 67, interface unit 65, computer output terminal 71 and cable 72.

[0041] Here, image data of the digital camera 49 having an infrared communication function are transmitted to the infrared communication port 44 which is a space wave communication port. The present invention, however, is in no way limited thereto only and can be applied to any data transmitted from information apparatus having a space wave communication function such as of infrared rays. Similarly, furthermore, the CD-R 57 and CD-ROM 69 are used as storage means. The invention, however, is in no way limited thereto only, and there can be used a magnetic disk such as a floppy disk or a magneto-optical disk such as a mini-disk. Moreover, embodiments can be modified in a variety of ways without departing from the scope of the invention, which is defined by the independent claim 1.

[0042] As described above, the storage/reproducing device and the reproducing device of the present invention make it possible to easily and directly fetch data from information apparatus without any cable, as long as the information apparatus of the data transmitting side is provided with a space wave communication function, and, further, make it possible to record and reproduce data or to output data directly to a personal computer. The space wave communication port for fetching data requires an installation space smaller than that required by a connector, and can be easily disposed though the storage device has a small thickness without marring the appearance. Moreover, no limitation is imposed on the personal computer body such as a desk-top personal computer or the like contributing to improving the performance of the personal computer which is not furnished with a space wave communication function.

Claims

1. A storage device (13) comprising a computer input/output unit (35) provided with at least one input circuit and one output circuit, a plurality of input units (15, 16, 17), and being **characterised in that** the storage device further comprises:

   a storage unit (32) of optical, magnetical, or magneto-optical type having a recording circuit (30) and a reproducing circuit (3a);
   a first switching means (28) for connecting either an input circuit of said computer input/output unit (35) or an input circuit of one of said plurality of input units (15,16,17) to said recording circuit (30) of said storage unit (32);

a second switching means (26) for connecting the input circuit of one of said plurality of input units (15,16,17) to either said recording circuit (30) or to an output circuit connected to said computer input/output unit (35);
a third switching means (34) for connecting either a reproducing circuit (39) of said storage unit (32) or the input circuit of one of said plurality of input units (15,16,17) to an output circuit connected to said computer input/output unit (35); and

in that one (16) of said plurality of input units (15,16,17) is a space wave communication port.

2. A storage device according to claim 1, wherein one (15) of said plurality of input units (15,16,17) is a unit for accommodating and reading a PC card.

3. A storage device according to claim 1 or 2, wherein one (17) of said plurality of input units (15,16,17) is a telephone circuit connection portion.

Patentansprüche

1. Speichervorrichtung (13) mit einer Computereingabe/ausgabeeinheit (35), die mit zumindest einem Eingabeschaltkreis und einem Ausgabeschaltkreis versehen ist, einer Mehrzahl von Eingabeeinheiten (15, 16, 17), die **dadurch gekennzeichnet ist, daß** die Speichervorrichtung weiterhin aufweist:

eine Speichereinheit (32) eines optischen, magnetischen oder magnetooptischen Typs mit einem Aufzeichnungsschaltkreis (30) und einem Wiedergabeschaltkreis (3a),

ein erstes Schaltmittel (28) zum Verbinden entweder eines Eingabeschaltkreises der Computereingabe-/-ausgabeeinheit (35) oder eines Eingabeschaltkreises von einer der Mehrzahl von Eingabeeinheiten (15, 16, 17) mit dem Aufzeichnungsschaltkreis (30) der Speichereinheit (32),

ein zweites Schaltmittel (26) zum Verbinden des Eingabeschaltkreises von einer der Mehrzahl von Eingabeeinheiten (15, 16, 17) mit entweder dem Aufzeichnungsschaltkreis (30) oder mit einem Ausgabeschaltkreis, der mit der Computereingabe-/-ausgabeeinheit (35) verbunden ist,

ein drittes Schaltmittel (34) zum Verbinden entweder eines Wiedergabeschaltkreises (39) der Speichereinheit (32) oder des Eingabeschaltkreises von einer der Mehrzahl von Eingabeeinheiten (15, 16, 17) mit einem Ausgabeschaltkreis, der mit der Computereingabe-/-ausgabeeinheit (35) verbunden ist, und

daß eine (16) der Mehrzahl von Eingabeeinheiten (15, 16, 17) ein Raumwellenkommunikationsanschluß ist.

2. Speichervorrichtung nach Anspruch 1, bei der eine (15) der Mehrzahl von Eingabeeinheiten (15, 16, 17) eine Einheit zum Aufnehmen und Lesen einer PC-Karte ist.

3. Speichervorrichtung nach Anspruch 1 oder 2, bei der eine (17) der Mehrzahl von Eingabeeinheiten (15, 16, 17), ein Telefonschaltkreisverbindungsteil ist.

Revendications

1. Dispositif de stockage (13) comprenant une unité d'entrée/sortie d'ordinateur (35) dotée d'au moins un circuit d'entrée et un circuit de sortie, une pluralité d'unités d'entrée (15, 16, 17), et

caractérisé en ce que le dispositif de stockage comprend en outre :

une unité de stockage (32) de type optique, magnétique ou magnéto-optique possédant un circuit d'enregistrement (30) et un circuit de reproduction (39) ;
un premier moyen de commutation (28) pour raccorder soit un circuit d'entrée de ladite unité d'entrée/sortie d'ordinateur (35), soit un circuit d'entrée d'une parmi ladite pluralité d'unités d'entrée (15, 16, 17), audit circuit d'enregistrement (30) de ladite unité de stockage (32) ;
un deuxième moyen de commutation (26) pour raccorder le circuit d'entrée d'une parmi ladite pluralité d'unités d'entrée (15, 16, 17) soit audit circuit d'enregistrement (30), soit à un circuit de sortie raccordé à ladite unité d'entrée/sortie d'ordinateur (35) ;
un troisième moyen de commutation (34) pour raccorder soit un circuit de reproduction (39) de ladite unité de stockage (32), soit le circuit d'entrée d'une parmi ladite pluralité d'unités d'entrée (15, 16, 17) à un circuit de sortie raccordé à ladite unité d'entrée/sortie d'ordinateur (35) ; et

en ce qu'une (16) parmi ladite pluralité d'unités d'entrée (15, 16, 17) est un port de communication par l'onde d'espace.

2. Dispositif de stockage selon la revendication 1, dans lequel une (15) parmi ladite pluralité d'unités

d'entrée (15, 16, 17) est une unité pour recevoir et lire une carte PC.

3. Dispositif de stockage selon la revendication 1 ou 2, dans lequel une (17) parmi ladite pluralité d'unités d'entrée (15, 16, 17) est une portion de raccordement de circuit téléphonique.

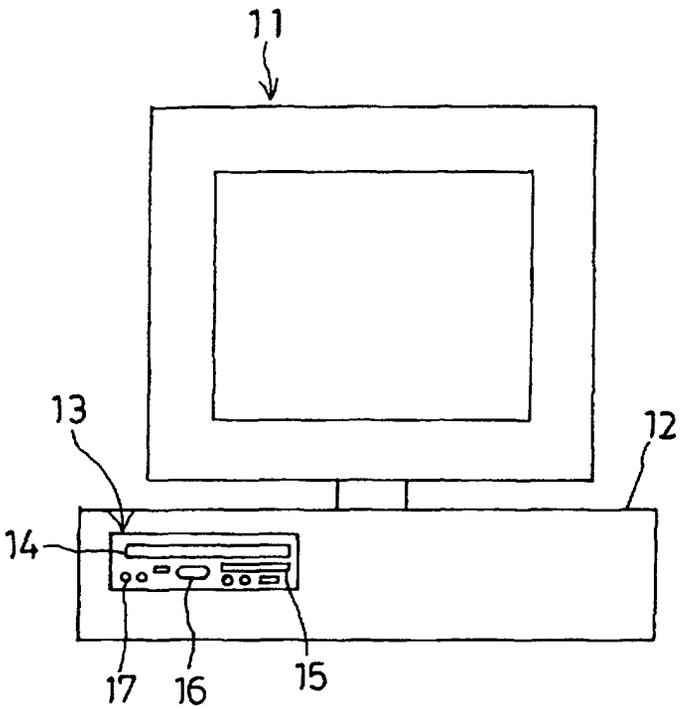


FIG 1

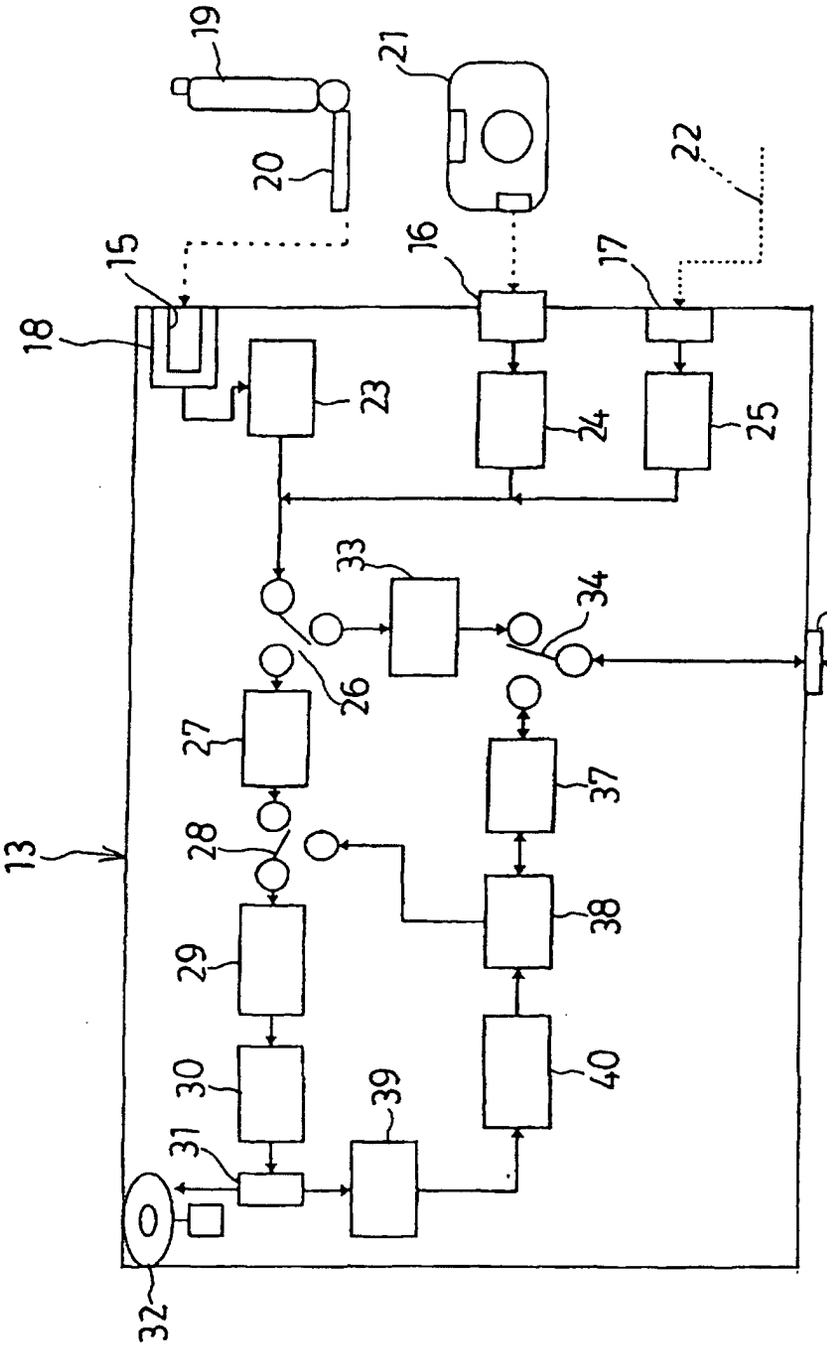

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12
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FIG 2

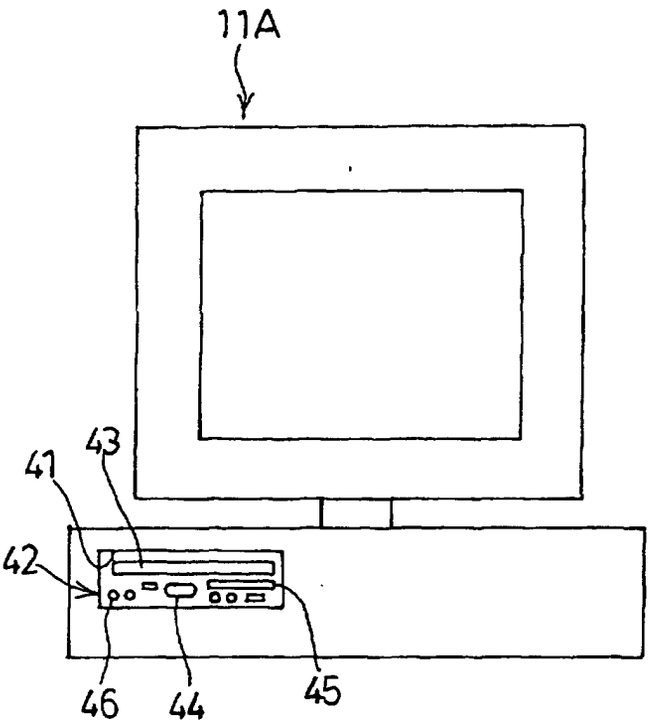


FIG 3

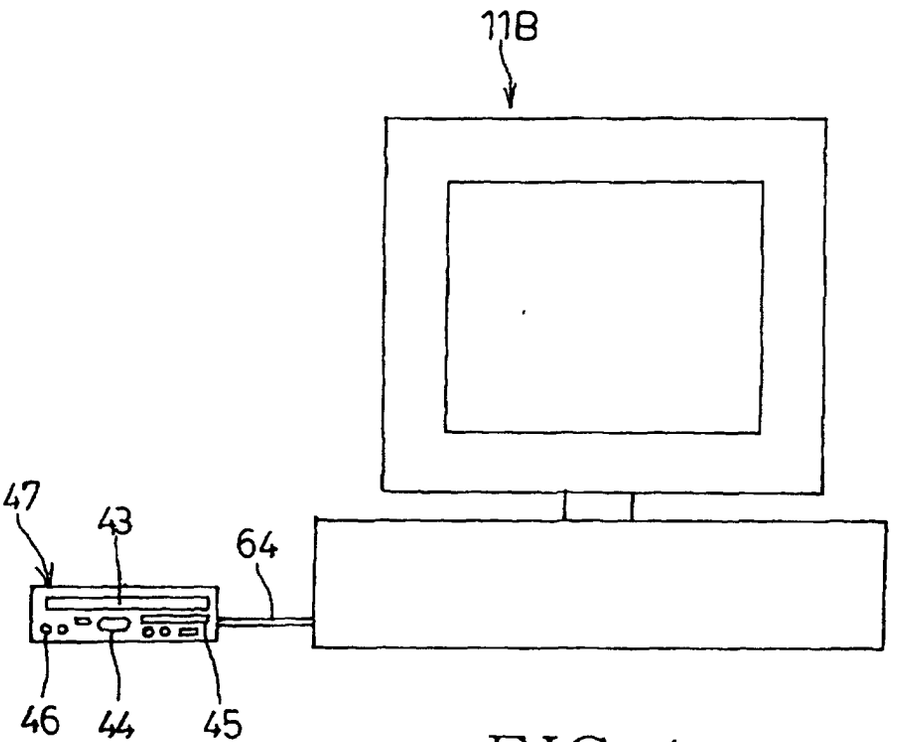


FIG 4

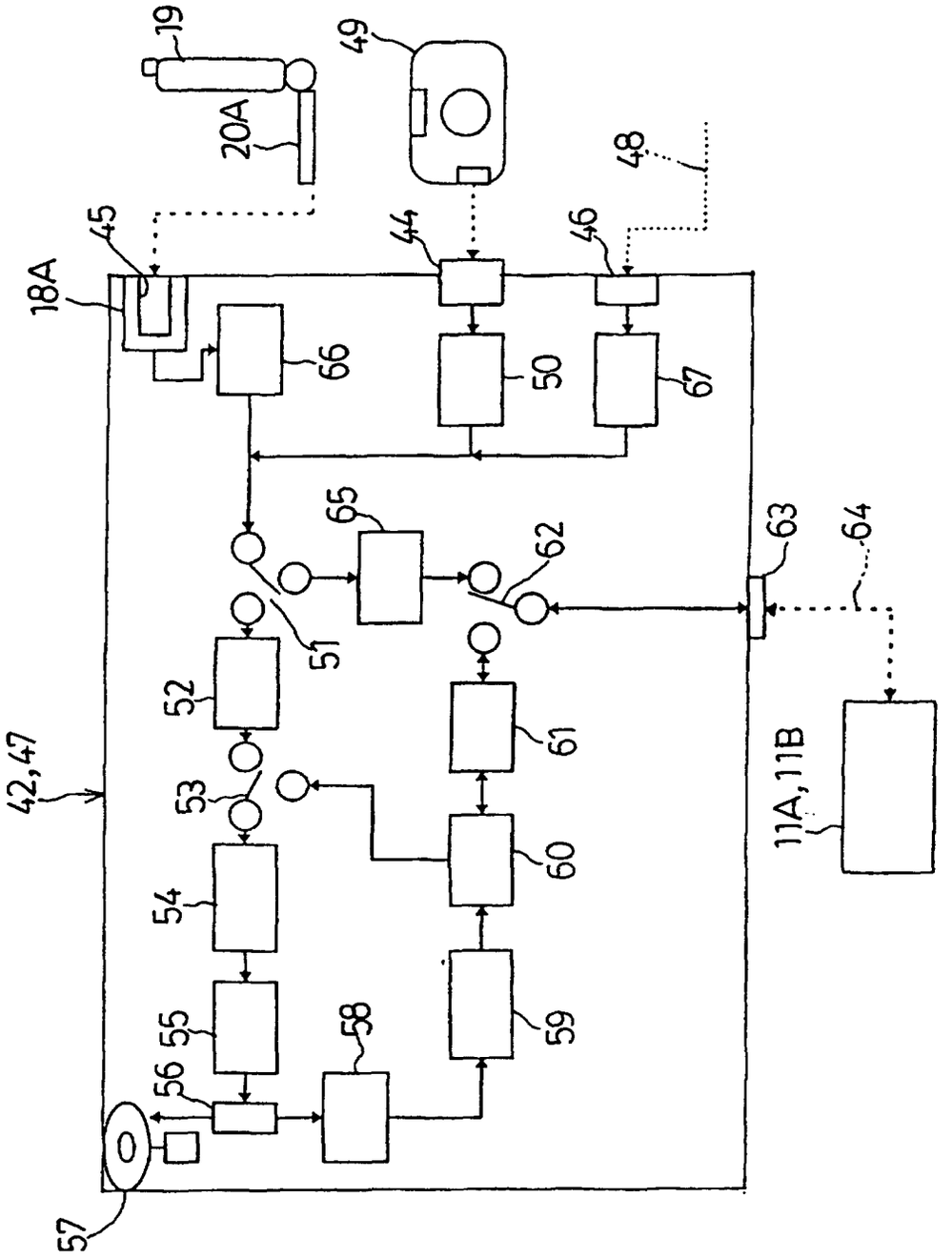

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20A
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48
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18A
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67
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64
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42,47
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60
11A,11B
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FIG 5

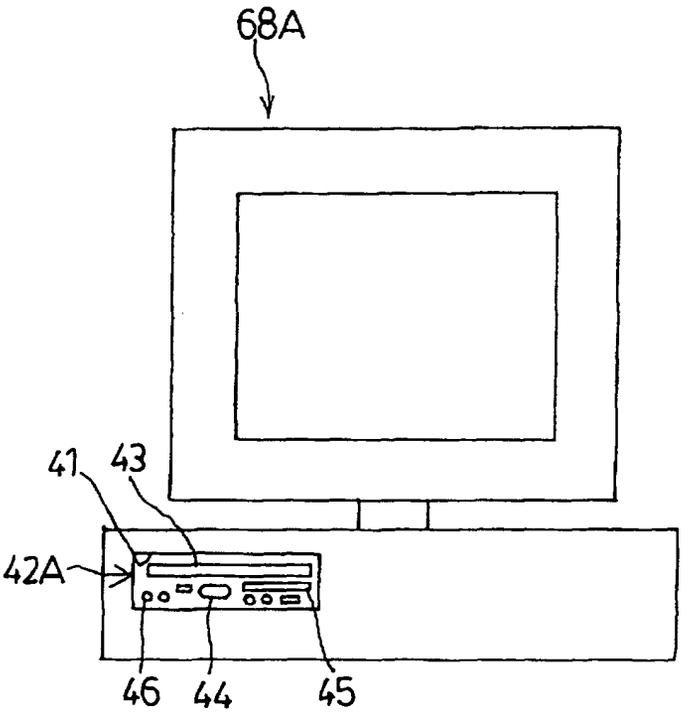


FIG 6

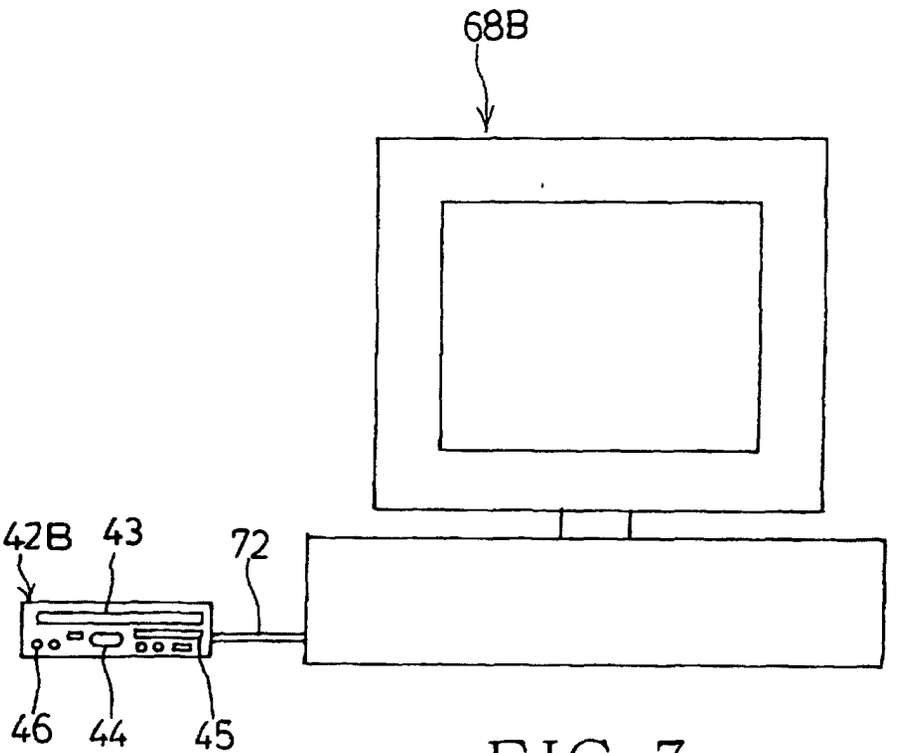


FIG 7

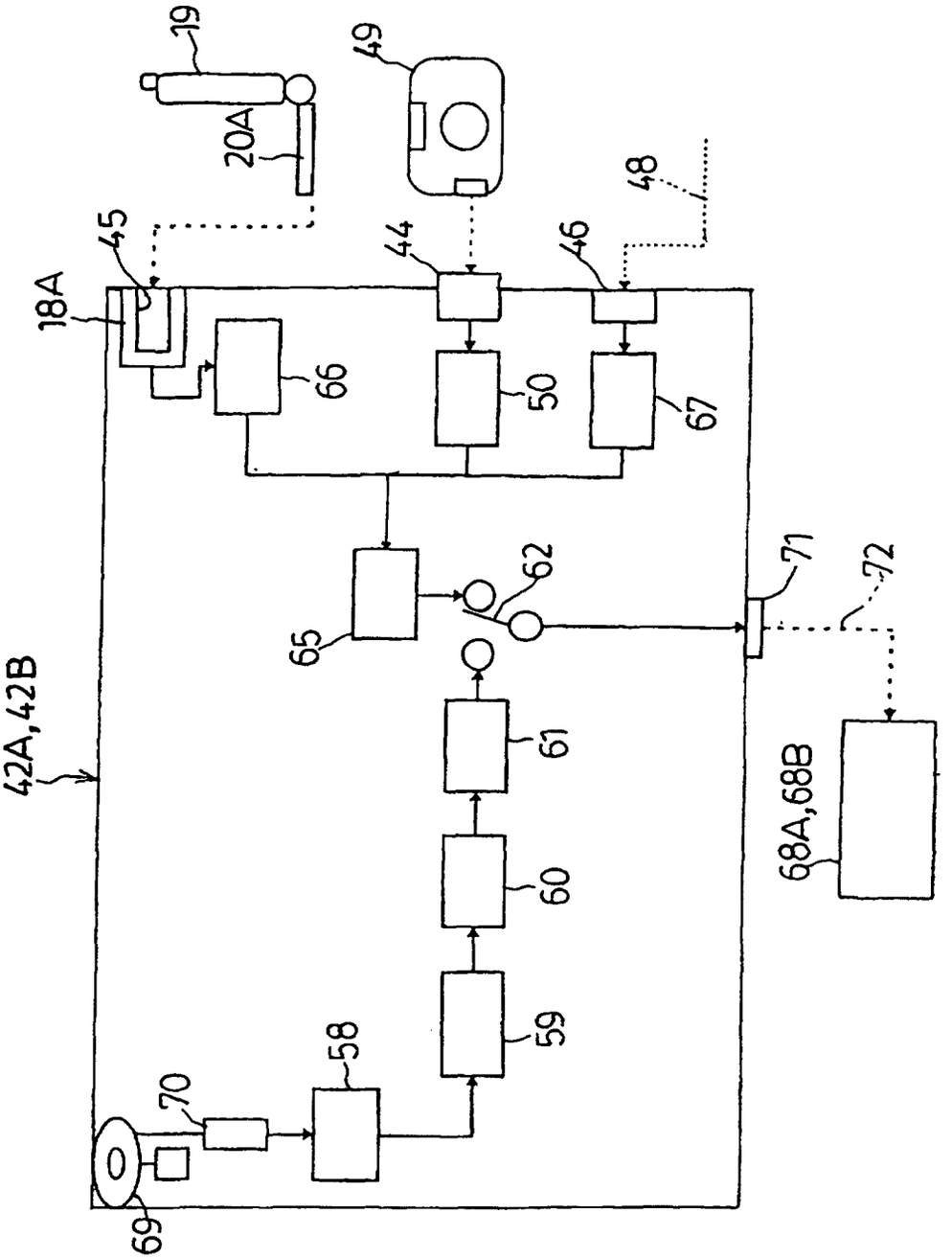

19
20A
49
48
45
44
46
18A
66
50
67
62
71
72
65
61
60
59
58
70
69
42A,42B
68A,68B

FIG 8